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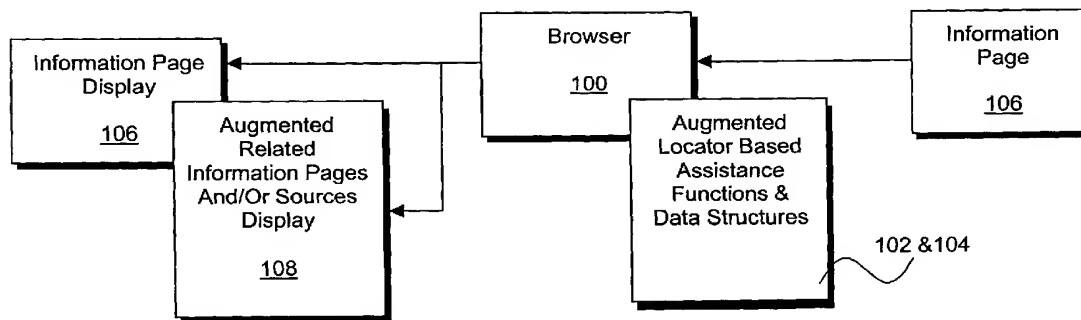
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(54) Title: LOCATOR BASED ASSISTED INFORMATION BROWSING



(57) Abstract: An automated method including automatic conditional provisioning of replacement and/or additional information (108) display for assisting a user of the client system (100) in retrieving and browsing information is disclosed. Under the method, in response to the retrieval and display on a display (106) of a client system a first information page (108) (or the formation/de-assembly of the retrieval request), the assistance display is conditionally provided automatically. The automatic conditional provisioning is based at least in part on the locator of the first information page, employing a number of locator based conditions or locator forming information, employing a number of locator forming information conditions (102, 104). In one embodiment, the conditions (102, 104) are patterns specifying families of URLs or URLs forming information. In one embodiment, the replacement/additional information pages (108) may contain identifiers/locators for related information pages (108).



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Locator Based Assisted Information Browsing

Related Application

This application is a continuation-in-part application to U.S. Patent Application number 10/010,973, filed on December 5, 2001, entitled "Locator Based Assisted Information Browsing", which itself is a continuation-in-part of U.S. Patent Application number 09/452,328, filed on November 30, 1999, entitled "Dynamic Content Based Assisted Information Browsing". The specifications of which are hereby fully incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of computerized information retrieval and browsing. More specifically, the present invention relates to methods and apparatuses associated with locator based assistance provided to facilitate information retrieval and browsing.

2. Background Information

With the recent advances in microprocessor, telecommunication and networking technology, increasing number of computer systems are being networked together through private and public networks, such as the Internet. Volumes of information stored on information servers (such as web servers of the World Wide Web) are now available to users of computer systems with a few clicks of a mouse button. For many users, the ease of access has actually created an information overload situation. An early solution has been to categorize as much of the information available as possible, such as the directory or index services offered by Internet portals like Yahoo and Lycos. Even then, a simple search restricted to one categorization could still result in hundreds of potential hits, requiring a large amount of user time to sort out the useless from the useful. As a result, users are frustrated, and information

technology is prevented from realizing its full potential in reaching the ubiquitous state.

Various automated techniques in assisting a user in retrieving and browsing information have been proposed and/or experimented. In U.S. Patent 5,727,129, entitled "Network system for profiling and actively facilitating user activities", issued to Barrett et al, a system and method for assisting a user in accessing information stored at remote network sites was disclosed. Under Barrett, an archive is maintained of remote sites accessed and instances in which the same remote sites are accessed in sequence. Statistics regarding information such as the number of times a site has been accessed, and the times a given set of sites have been accessed in sequence are maintained. Based on this information, information items are identified which the user is predicted to be likely to want to access. In U.S. Patent 5,960,429, entitled "Multiple reference hotlist for identifying frequently retrieved web pages", issued to Peercy et al, a method and apparatus for locating web pages was disclosed. Under Peercy, a count of retrievals of a web page is accumulated and the accumulated count and an address for the web page are stored in a record of a history log database. A multiple reference hotlist is formatted for the user from the records in the history log.

Additionally, in co-pending application number 09/452,328, entitled "Dynamic Content Based Assisted Information Browsing", filed on November 30, 1999, presently assigned to the same assignee, a method for providing information browsing assistance based on the contents of the information being browsed is disclosed.

Each of these techniques has its pros and cons. Additional techniques that can improve the ease of information retrieval and browsing, even in limited circumstances, with lesser demands on processing power, are nevertheless still desired.

SUMMARY OF THE INVENTION

An automated method including automatic conditional provisioning of replacement and/or additional information display for assisting a user of the client system in retrieving and browsing information is disclosed. Under the method, in response to the retrieval and display on a display of a client system a first information page or the formation/de-assembly of the retrieval request, the assistance display is conditionally provided automatically. The automatic conditional provisioning is based at least in part on the locator of the first information page, employing a number of locator based conditions, or the information forming the locator, employing a number of locator forming information conditions. In one embodiment, the conditions are patterns specifying families of URLs or URL forming information. In one embodiment, the replacement/additional information pages may contain identifiers/locators for related information pages.

BRIEF DESCRIPTION OF DRAWINGS

The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like references denote similar elements, and in which:

Figure 1 illustrates an overview of the present invention;

Figure 2 illustrates a browser and the augmented locator based assistance function and data structure of **Fig. 1** in further detail, in accordance with one embodiment;

Figures 3a-3e illustrate a number of example locators (URLs), locator based or locator forming information conditions (URL or URL forming information patterns) that encompass the example locators (URLs), and an XML like specification scheme for specifying assistance to be provided (URL/UFI Triggers) for the locator based or locator forming information conditions (URL/UFI patterns), in accordance with one embodiment each;

Figure 4 illustrates a locator based or locator forming information condition (URL/UFI pattern) data structure for storing locator based locator forming information conditions (URL/UFI patterns), in accordance with one embodiment;

Figure 5 illustrates the relevant aspect of the operational flow of the analyzer function of **Fig. 2**, in accordance with one embodiment;

Figures 6a-6d illustrate a number of alternative dispositions of the analyzer function and locator based or locator forming information condition data structure for practicing the present invention, in accordance with two embodiments; and

Figure 7 illustrates an example digital system suitable for practicing the present invention.

DETAILED DESCRIPTION OF THE INVENTION

As summarized, the present invention includes methods and apparatuses for providing information browsing assistance, based on the information of the locators of information pages requested. In the following description, various aspects of the present invention will be described. However, the present invention may be practiced with only some or all aspects of the present invention. For purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the present invention. However, the present invention may be practiced without the specific details. In other instances, well known features are omitted or simplified in order not to obscure the present invention.

Parts of the description will be presented using terms such as locators, identifiers, functions, data structures and so forth, commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art. Parts of the description will be presented in terms of operations performed by a computer system, using terms such as parsing, accessing,

retrieving, and so forth. As well understood by those skilled in the art, these quantities take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, and otherwise manipulated through mechanical, electrical and optical components of a digital system. The term digital system includes general purpose as well as special purpose data processing machines, systems, and the like, that are standalone, adjunct or embedded.

Various operations will be described as multiple discrete steps performed in turn in a manner that is most helpful in understanding the present invention, however, the order of description should not be construed as to imply that these operations are necessarily order dependent, in particular, the order the operations are presented. Furthermore, the phrase "in one embodiment" will be used repeatedly, however the phrase does not necessarily refer to the same embodiment, although it may.

Overview

Referring now to **Figure 1**, wherein an overview of the present invention, in accordance with one embodiment, is shown. As illustrated, for the embodiment, in accordance with the present invention, browser **100** is augmented with at least an information browsing assistance function **102** and a complementary data structure **104** to conditionally provide locator based information browsing assistance to a user retrieving and browsing information pages **106**. More specifically, assistance function **102** and data structure **104** enable browser **100** to facilitate augmented conditional provisioning of replacement and/or additional complementary information pages **108**, when corresponding locator based conditions or locator forming information conditions are met. That is, the assistance information pages may be provided as replacement information pages (replacing the requested information pages) or additional information pages (complementary to the requested information

pages). Further, in various embodiments, one or more of the replacement/additional complementary information pages **108** may include suggestions (having associated information source identifiers) of additional information pages.

Information pages **106-108** represent a broad range of informational units known in the art, including but not limited to information “documents” formed using mark-up languages, such as HTML and XML.

In one embodiment, the locators of the information pages are Uniform Resource Identifiers (URIs) as specified by RFC2396 of the Internet Engineering Task Force, generally although not necessarily Uniform Resource Locators (URLs), and the locator based conditions are URI or URL based conditions. That is, information browsing assistance is provided if a pre-specified URL or URL forming information (UFI) condition (having associated information browsing assistance to be provided) is met. As will be described in more detail below, in various embodiments, each of the URL or UFI conditions is expressed as an URL/UFI pattern (implicitly) specifying a family of URLs/UFI, and the associated information browsing assistance to be provided (when one of the implicitly specified URLs is requested), to be described more fully below referencing **Fig. 3a-3e**.

As those skilled in the art would appreciate, the locator based and the locator forming information embodiments achieve the same results, and differ only from each other only in terms of when the determination to provide assistance is performed. In the former case, the determination is performed after the locator has been formed, whereas in the latter, the determination may be performed while the locator is being formed (e.g. on the client) or while the locator is being de-assembled (e.g. at a server).

Additionally, those skilled in the art will realize that the described methods apply to other embodiments which may be based on non-

standardized naming schemes similar to URIs and URLs, and also to further refinements to standards such as RFC 2396 which may be made from time to time. In another embodiment, the path information may be the physical or logical name space of a file storage system, those skill in the art will recognize the technical similarity between such name spaces and URL names (specifically, in that any local file or resource on a computer can typically be represented through use of the file:// URI prefix).

Browser Architecture

Figure 2 illustrates augmented browser **100** in further detail, including its relation with information browsing assistance function **102** and complementary data structure **104**, in accordance with one embodiment. As illustrated, browser **100** includes conventional elements found in many browsers known in the art, HTTP interface **262**, HTML web page handler **264**, JAVATM and JavaScript execution engine **266**, other script interpreter **268** (e.g. CGI), display interface **270**, and a number of “plug-ins” (or add-ons), shown as additional ActiveX components **272-274**. Included among these ActiveX components **272-274** is monitor function **272** of assistance function **102** responsible for interfacing with analyzer function **282** of assistance function **102**. In other words, for the embodiment, assistance function **102** is distributively implemented with monitor function **272** being added to or integrated with browser **100**.

Monitor function **272** registers itself with browser **100** to be notified of various browsing events of interest. In one embodiment, these browsing events of interest include in particular when browser **100** receives information (such as search criteria) from a user to form a request for an information page or requests for information pages (e.g. in response to directions from a user) or when browser **100** is directed to obtain information programmatically on behalf of another program or hardware device. Upon receipt of these notifications,

monitor function **272** relays the occurrence of these events to augmented assistance function **102**.

In alternate embodiments, browser **100** may be equipped with the capabilities to interface with analyzer function **282** directly. In other embodiments, analyzer function **282** may also be integrated with browser **100** instead.

Data structure **104** stores the locator based or locator forming information conditions. As alluded to earlier, for the earlier described URL based embodiments, data structure **104** stores the URL/UFI patterns. In one embodiment, data structure **104** is a tree-like data structure, with different portions of a URL/UFI pattern store in corresponding nodes of the tree-like data structure, and the leaf node of these nodes storing the associated information browsing assistance to be provided, to be described more fully later referencing **Fig. 4**.

In one embodiment, an editor (not shown) is provided to facilitate entry of the URL/UFI patterns into data structure **104**. In another embodiment, the URL/URI pattern may be specified using pre-determined language elements (e.g. XML), and a reader (not shown) capable of comprehending the pre-determined language elements is provided to read the specified URL/UFI patterns (expressed using the pre-determined language elements), and store the specified URL/UFI patterns in data structure **104**.

Augmented assistance function **102**, more specifically, analyzer function **282**, (as described in more detail below referencing **Fig. 5**), is equipped to determine whether a locator of a requested information page satisfies one of the pre-specified locator based conditions stored in augmented data structure **104** or whether a locator of an information page to be formed satisfies one of the pre-specified locator forming information condition. For the earlier described URL/UFI based embodiments, analyzer function **282** is equipped to

determine whether the URL of a requested information page matches one of the pre-specified URL patterns stored in augmented data structure **104** or whether the URL forming information matches one of the pre-specified UFI patterns stored in augmented data structure **104**.

Locator, Locator Based/Locator Forming Information Conditions and
Associated Browsing Assistance

Figure 3a illustrates a number of example locators of information pages **300**, more specifically, example URLs of information pages, in accordance with one embodiment. Example URLs **302** and **304** identify a “news” page each, available from the portals “msnbc” and “yahoo” respectively. Similarly, example URLs **306** and **308** identify a “sports” page each, available from the portals “msnbc” and “yahoo” respectively. Example URLs **310** and **312** identify a result page each, to be returned in response to a search having the keyword “dog”, available from the search engines “google” and “altavista” respectively.

Of course, as those skilled in the art will appreciate, the example URLs **306** and **308** could be considered as identifying a “news” page each. In other words, the classification or differentiation of “sports” as a special category of “news” is arbitrary and application dependent. Further, from the description to follow, those skilled in the art will appreciate that the present invention may be practiced with a wide range of other similar locators or URLs.

Figure 3b and 3d illustrate a number of example locator conditions **320** and locator forming information conditions **330** respectively; more specifically, example URL/UFI patterns that encompass the above example locators or URLs, in accordance with one embodiment each. As illustrated, locator conditions or URL patterns **322** and **323** and locator forming information conditions and UFI patterns **332** and **333** having the keyword “news” placed at the illustrated positions encompass the earlier described example locator or URL **302** and **304** respectively, and other news oriented information pages

identified by locators/URLs of like kinds. An asterisk in locator condition or URL pattern **322/323** and UFI condition or UFI pattern **332/333** stands for a “wildcard” that may be satisfied by any value in the corresponding position of a locator/URL (to be formed). In other embodiments, other characters may be used in locator or locator forming information conditions to represent wildcard characters or specific matching behaviors. Pattern matching algorithms familiar to those skilled in the art such as regular expressions may also be employed. Similarly, locator or locator forming information conditions or URL/UFI patterns **324-325** and **334-335** having the keyword “SPTs” or “sports” placed at the illustrated positions encompass the earlier described example locator or URL **306** and **308** respectively, and other sports oriented information pages identified by locators/URLs of like kinds. Locator or locator forming information conditions or URL/UFI patterns **326-326** and **336-337** having the keyword “dog” or “q=dog” placed at the illustrated positions encompass the earlier described example locator or URL **310** and **312** respectively, and other result information pages identified by locators/URLs of like kinds. Accordingly, each of locator or locator forming information conditions or URL/UFI patterns **320/330** implicitly identifies a family of locators or URLs, or a family of locators or URLs forming information.

Assuming in each of these situations, i.e. for each locator or URL that satisfies these conditions or patterns **322-328** and **332-338**, the associated assistance is a corresponding assistance information page from a “help” web site “mysite”, the associated assistance may be specified using an XML like specification language, in accordance with one embodiment, as illustrated. For example, the “news” oriented assistance information page to be displayed from “mysite.com” when URL/UFI patterns **322-323** or **332-333** are met or matched, may be specified through URL/UFI trigger **340/350** enumerating the “news” information page to be displayed from “mysite.com”. URL/UFI trigger **340/350**

comprises URL/UFI patterns **342-344** and **352-354**, denoting the conditions under which the specified assistance is to be provided. For the embodiment, the URL/UFI patterns and the assistance to be triggered are specified using the XML like statements illustrated. Similarly, the “sports” oriented assistance information page to be displayed from “mysite.com” when URL/UFI patterns **324-325** or **334-335** are met or matched, may be specified through URL/UFI trigger **360/370** enumerating the “news” information page to be displayed from “mysite.com”. URL trigger **360/370** comprises URL/UFI patterns **324-325** or – **334-335**, denoting the conditions under which the assistance is to be provided. The “dog” oriented assistance information page to be displayed from “mysite.com” when URL/UFI patterns **326-327** or **336-337** are met or matched, may be specified through URL/UFI trigger **380/390** enumerating the “dogs” information page to be displayed from “mysite.com”. URL/UFI trigger **380/390** comprises URL/UFI patterns **382-384** and **392-394**, denoting the conditions under which the assistance is to be provided. The described relationships in these examples are merely illustrative, and those skilled in the art will recognize that the scope of the present invention includes logical relationships between locator/locator forming information conditions and URL/UFI triggers that are based on more than simple subject matches. In some embodiments, analyzer logic **282** may use arbitrarily complex decision factors to map an URL/UFI pattern to an appropriate assistance information page.

Even though only a handful of example locators, locator based/locator forming information conditions and associated assistance are illustrated, as alluded to earlier, those skilled in the art will appreciate the illustrated manner of specifying locator based/locator forming conditions and the assistance to be provided may be practiced for a wide range of locators.

Locator Based/Locator Forming Information Condition (URL/UFI
Pattern) Data Structure

Figure 4 illustrates a locator based/locator forming information condition (URL/UFI pattern) data structure suitable for use to store locator based/locator forming information conditions (URL/UFI patterns) to practice the present invention, in accordance with one embodiment. As illustrated, for the embodiment, locator based/locator forming information condition or URL/UFI pattern data structure **104** is a tree like data structure comprising a number of nodes, e.g. nodes **402-414**. Nodes **414** are said to be leaf nodes of predecessor nodes, such as nodes **402-410**. The various portions of a locator based/locator forming information condition or a URL are stored in corresponding nodes. For example, the various portions of URL/UFI pattern **320-330** are stored in corresponding nodes **402-410**, whereas the various portions of URLs **300** are stored in nodes **402** and **410**. Child node or URL/UFI Trigger **414** specifies the assistance or URL action to be triggered when the locator of a requested information satisfies the URL condition or matched the URL pattern or the locator to be formed satisfies a UFI condition.

As will be described in more detail below, in one embodiment, assistance function **102**, more specifically, analyzer function **282** determines whether the locator or URL of the requested information page satisfies a locator based condition or matches a URL pattern or a locator to be formed satisfies a UFI condition/pattern by traversing the tree like data structure **104**.

Operational Flow of Assistance Function

Figure 5 illustrates the relevant aspects of the operational flow of assistance function **102** (more specifically, analyzer function **282**), in accordance with one embodiment. As illustrated, upon receipt of a notification of an information page request event or information forming a request from monitor function **272**, block **502**, analyzer function **282** determines if one of the

locator based/locator forming information conditions is met, block **504**. (Note the information forming a request may be received while the request is being formed or after receiving the request while the request is being de-assembled.) For the earlier described embodiment, where the locator based/locator forming information conditions are URL/UFI patterns, and the URL/UFI patterns are stored in a tree like data structure **104**, analyzer function **282** traverses the tree like data structure **104** to determine if one of the URL/UFI patterns is met.

If locator based/locator forming information condition (URL/UFI pattern) is not met, for the embodiment, no information browsing assistance is provided. However, if one of the locator based/locator forming information condition (URL/UFI pattern) is met, analyzer function **282** causes the corresponding information browsing assistance to be provided, block **506**. As described earlier, for the URL/UFI pattern embodiment, in particular, the embodiment where the URL/UFI patterns are stored in a tree like data structure, the assistance is specified in the leaf node of the nodes storing the matching URL/UFI pattern.

Further, these assistance may take the form of one or more replacement information pages and/or one or more additional complementary information pages. Whether replacement or additional information pages are provided, one or more of the assistance information page may comprise information source identifiers identifying information pages of potential interest (in view of the information page being requested).

Disposition of Analyzer Function and Condition Data Structure

Figures 6a-6d illustrate four alternative dispositions of assistance function **102**, condition data structures **104**, monitor function **272** and analyzer function **272**, suitable for practicing the present invention, in accordance with four embodiments. The embodiment of **Fig. 6a** represents an embodiment, where all the relevant earlier described elements, i.e. monitor function **272**,

analyzer function **282**, and data structure **104** are all provided to a client system **602** coupled to a network (e.g. the Internet). These relevant elements may be loaded onto client system **602** via a distribution medium (not shown) or downloaded from a distribution server (not shown).

The embodiment of **Fig. 6b** represents an alternate embodiment, where only monitor **272** is provided to a client system **602** coupled to a network (e.g. the Internet). Otherwise, analyzer function **282** and data structure **104** are disposed on portal or service server **604** instead. During operation, upon being notified of a request for an information page, monitor function **272** notifies analyzer function **102** via the coupling network. The notification may be accomplished using any one of a number of communication protocols known in the art. Analyzer function **282**, using data structure **104**, would perform the analysis, and if appropriate, triggers the information browsing assistance for client system **602** remotely from server **604**. Similarly, monitor function **272** may be loaded onto client system **602** via a distribution medium (not shown) or downloaded from a distribution server (not shown). In selected embodiments, server **604** may also assume the role of the distribution server.

The embodiment of **Fig. 6c** represents yet another alternate embodiment, where monitor function **272** is provided to an information server **606** coupled to a network (e.g. the Internet). Analyzer function **282** and data structure **104** are disposed on portal or service server **604** as in **Fig. 6b**. During operation, upon being receipt of a request for an information page, monitor function **272** notifies analyzer function **102** via the coupling network. The notification may be accomplished using any one of a number communication protocols known in the art. Analyzer function **282**, using data structure **104**, would perform the analysis, and if appropriate, triggers the information browsing assistance for client system **602**. Similarly, monitor function **272** may be loaded onto information server **606** via a distribution

medium (not shown) or downloaded from a distribution server (not shown). Again, in selected embodiments, server **604** may also assume the role of the distribution server.

The embodiment of **Fig. 6d** represents yet another alternate embodiment, where all the relevant earlier described elements, i.e. monitor function **272**, analyzer function **282**, and data structure **104** are all provided to an information server **606** coupled to a network (e.g. the Internet). These elements operate as earlier described when information server **606** receives a request for an information page. As described earlier, the analysis may be performed on the received locator itself, or information de-assembled from the locator. Similarly, the relevant elements may be loaded onto information server **606** via a distribution medium (not shown) or downloaded from a distribution server (not shown).

Example Computer System

Figure 7 illustrates one embodiment of an exemplary digital system suitable for use to practice the present invention, either as a client system or a server system. As a client system, digital system **700** may be a desktop computer system, a laptop computer system, a palm sized computing device, a wireless mobile phone, a set-top box, an Internet appliance and the like. As a server, digital system **700** may a single or a cluster of computer systems. As shown, exemplary digital system **700** includes one or more processors **702** and system memory **704**. Additionally, system **700** includes mass storage devices **706** (such as diskette, hard drive, CDROM and so forth), input/output devices **708** (such as keyboard, cursor control and so forth) and communication interfaces **710** (such as network interface cards, modems and so forth). The elements are coupled to each other via system bus **712**, which represents one or more buses. In the case of multiple buses, the buses are bridged by one or more bus bridges (not shown). Each of these elements performs its

conventional functions known in the art. In particular, system memory **704** and mass storage **706** are employed to store a working copy and a permanent copy of the programming instructions implementing the teachings of the present invention. The permanent copy of the programming instructions may be loaded into mass storage **706** in the factory, or in the field, as described earlier, through a distribution medium (not shown) or through communication interface **710** (from a distribution server (not shown)). The constitution of these elements **702-712** are known, and accordingly will not be further described.

Conclusion and Epilog

Thus, a novel method and apparatus for assisting a user in information retrieval and browsing, based on the locator of a requested information page or a locator to be formed has been described. While the present invention has been described in terms of the above illustrated embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments described. In particular, the present invention is not limited to the HTTP or any other communication protocols, nor locators of the URL type. The present invention can be practiced with modification and alteration within the spirit and scope of the appended claims. The description is thus to be regarded as illustrative instead of restrictive on the present invention.

CLAIMS

What is claimed is:

1. In a client system, an automated method for assisting a user of the client system in retrieving and browsing information, the method comprising:
determining on said client system, based at least in part on information of a locator of a first information page requested to be retrieved and displayed on the client system, whether to provide information browsing assistance, said information forming at least a part of the locator, and said locator identifying the first information page and a location from which the first information page is to be retrieved; and
conditionally providing said information browsing assistance, based at least in part on said determination.
2. The method of claim 1, wherein said locator is a uniform resource locator (URL).
3. The method of claim 1, wherein said determining comprises analyzing whether a selected one of a locator forming information condition and a locator based condition for providing information browsing assistance is met.
4. The method of claim 1, wherein
said locator is a uniform resource locator (URL);
said determining comprises analyzing a selected one of (a) whether said information forming said URL satisfies an URL information forming condition and (b) whether said URL satisfies a URL based condition for providing information browsing assistance is met.
5. The method of claim 4, wherein
each condition comprises a pattern specifying a selected one of a family of URL forming information and a family of URLs; and
said analysis comprises matching selected one of URL forming information and said URL against a plurality of patterns.

6. The method of claim 5, wherein
each pattern comprises a plurality of portions correspondingly stored in a plurality of nodes of a tree data structure, with the plurality of nodes having a child leaf node specifying information browsing assistance to be provided; and
said matching comprises traversing said tree data structure.
7. The method of claim 6, wherein the method further comprises
downloading said tree data structure from a server system onto said client system.
8. The method of claim 5, wherein the method further comprises
downloading said patterns and their corresponding information browsing assistance specifications from a server system onto said client system.
9. The method of claim 4, wherein the method further comprises
downloading said conditions and their corresponding information browsing assistance specifications from a server system onto said client system.
10. The method of claim 1, wherein said information browsing assistance
comprises displaying a second information page.
11. The method of claim 10, wherein said second information page
effectively replaces said first information page.
12. The method of claim 10, wherein said second information page is
additionally displayed complementing said first information page.
13. The method of claim 10, wherein said second information page
comprises a plurality of locators identifying a plurality of information pages and
corresponding locations from which the identified information pages of said
second information page are to be retrieved.
14. The method of claim 1, wherein said information browsing assistance
comprises modifying an environment attribute of a browsing environment within
which said determining and conditional provision of information browsing
assistance are performed.

15. The method of claim 14, wherein said environment attribute is an environment attribute selected from a group of environment attributes comprising a display resolution attribute, a color resolution attribute, a font selection attribute, a media player preference attribute, an add-on selection attribute, and a plug-in selection attribute.

16. The method of claim 1, wherein the method further comprises a selected one of (a) receiving information forming a request to retrieve and display said first information page, and (b) receiving the request to retrieve and display said first information page, said request including said locator.

17. The method of claim 16, wherein the method further comprises
in response to said receive of the selected one of the information forming a request and the request, notifying a monitor function of a browser helper of said receipt; and

said monitor function, in response to receipt of said notification, notifying an analyzer function of said browser helper, which performs said determining and conditional provision of information browsing assistance.

18. The method of claim 17, wherein the method further comprises executing said monitor function as an extension of a browser, and executing said analyzer function external to said browser.

19. An apparatus comprising:

storage medium having stored therein executable instructions designed to enable the apparatus to

determine on the apparatus, based at least in part on information of a locator of a first information page requested to be retrieved and displayed, whether to provide information browsing assistance, said information forming at least a part of said locator, and said locator identifying the first information page and a location from which the first information page is to be retrieved, and

conditionally provide said information browsing assistance based at least in part on said determination; and

at least one processor coupled to the storage medium to execute the executable instructions.

20. The apparatus of claim 19, wherein said locator is a uniform resource locator (URL).

21. The apparatus of claim 19, wherein said executable instructions are designed to enable the apparatus to perform said determining by analyzing a selected one of (a) whether a locator forming information condition and (b) whether a locator based condition for providing information browsing assistance is met.

22. The apparatus of claim 19, wherein
said locator is a uniform resource locator (URL); and
said executable instructions are designed to enable the apparatus to perform said determining by analyzing whether the selected one of said URL forming information and said URL satisfies a corresponding selected one of an URL forming information condition and an URL based condition for providing information browsing assistance is met.

23. The apparatus of claim 22, wherein
each condition comprises a pattern specifying a selected one of a family of URL forming information and a family of URLs; and
said executable instructions are designed to enable the apparatus to perform said analysis by matching the selected one of said URL forming information and said URL against a plurality of patterns.

24. The apparatus of claim 23, wherein
each pattern comprises a plurality of portions correspondingly stored in a plurality of nodes of a tree data structure, with the plurality of nodes having a child leaf node specifying information browsing assistance to be provided; and

said executable instructions are designed to enable the apparatus to perform said matching comprises traversing said tree data structure.

25. The apparatus of claim 19, wherein said executable instructions are designed to enable the apparatus to provide said information browsing assistance by displaying a second information page.

26. The apparatus of claim 25, wherein said executable instructions are designed to enable the apparatus to display said second information page in a manner that effectively replaces said first information page.

27. The apparatus of claim 25, wherein said executable instructions are designed to enable the apparatus to additionally display said second information page complementary to said first information page.

28. The apparatus of claim 25, wherein said second information page comprises a plurality of locators identifying a plurality of information pages and corresponding locations from which the identified information pages of said second information page are to be retrieved.

29. The apparatus of claim 19, wherein said executable instructions are designed to enable the apparatus to provide said information browsing assistance by modifying an environment attribute of a browsing environment within which said determining and conditional provision of information browsing assistance are performed.

30. The apparatus of claim 29, wherein said environment attribute is an environment attribute selected from a group of environment attributes comprising a display resolution attribute, a color resolution attribute, a font selection attribute, a media player preference attribute, an add-on selection attribute, and a plug-in selection attribute.

31. The apparatus of claim 19, wherein said executable instructions are further designed to enable the apparatus to receive a selected one of (a) information forming a request to retrieve and display said first information page

and (b) the request to retrieve and display said first information page, said request including said locator.

32. The apparatus of claim 31, wherein said executable instructions are designed to implement a browser helper including at least a monitor function and an analyzer function, with the monitor function of the browser helper being designed to receive a notification of said receipt, and in response, notifying said analyzer function of receipt of said notification, and said analyzer function in turn performs said determining and conditional provision of information browsing assistance.

33. The apparatus of claim 32, wherein said executable instructions are designed to implement said monitor function as an extension of a browser, and said analyzer function as an external function to said browser.

34. The apparatus of claim 33, wherein the apparatus is a selected one of a wireless telephone, a palm sized personal digital assistant, a notebook computer, a desktop computer, and a set top box.

35. In a first server system, a method of operation comprising:
receiving a request from a selected one of a client system and an information server for executable instructions designed to enable the selected one of the client system and the information server to conditionally provide information browsing assistance to the client system, based at least in part on information of a locator of a first information page requested to be retrieved and displayed on the client system, said information forming at least a part of the location and said locator identifying said first information page and a location from which said first information page is to be retrieved; and
in response, providing the selected one of said client system and said information server with said requested executable instructions.

36. The method of claim 35, wherein said locator is a uniform resource locator (URL).

37. The method of claim 35, wherein said executable instructions are designed to perform a selected one of (a) enabling the selected one of the client system and the information server to determine a selected one of whether a locator forming information condition and whether a locator based condition for providing information browsing assistance is met, and (b) enabling the selected one of the client system and the information server to provide a selected one of said locator forming information and said locator to a second server system for the second server system to determine for said client system a selected one of whether a locator forming information condition and whether a locator based condition for providing information browsing assistance is met.

38. The method of claim 37, wherein said first and second server systems are the same server system.

39. The method of claim 35, wherein
said locator is a uniform resource locator (URL); and
said executable instructions are designed to perform a selected one of (a) to enable the selected one of the client system and the information server to determine whether the selected one of said URL forming information and said URL satisfies a condition for providing information browsing assistance is met, and (b) to enable the selected one of the client system and the information server to provide the selected one of said URL forming information and said URL to a second server system for the second server system to determine for said client system whether a condition for providing information browsing assistance is met.

40. The method of claim 39, wherein
each condition comprises a pattern specifying a selected one of a family of URL forming information and a family of URLs; and
either (a) said executable instructions are designed to enable the selected one of the client system and the information server to match the

selected one of said URL forming information and said URL against a plurality of patterns, or (b) the method further comprises a second server system matching the selected one of said URL forming information and said URL against a plurality of patterns for the selected of said client system and said information server.

41. The method of claim 40, wherein

each pattern comprises a plurality of portions correspondingly stored in a plurality of nodes of a tree data structure, with the plurality of nodes having a child leaf node specifying information browsing assistance to be provided; and either (a) said executable instructions are designed to enable the selected one of the client system and the information server to perform said matching by traversing said tree data structure, or (b) the method further comprises a second server system performing said matching by traversing said tree data structure for the selected one of said client system and said information server.

42. The method of claim 35, wherein either (a) said executable instructions are designed to enable the selected one of the client system and the information server to provide said information browsing assistance by displaying a second information page or (b) the method further comprises a second server system providing said information browsing assistance to the selected one of said client system and said information server by causing a second information page to be displayed.

43. The method of claim 42, wherein said second information page is displayed in a manner that effectively replaces said first information page.

44. The method of claim 42, wherein said second information page is additionally displayed in a manner that is complementary to said first information page.

45. The method of claim 42, wherein said second information page comprises a plurality of locators identifying a plurality of information pages and corresponding locations from which the identified information pages of said second information page are to be retrieved.

46. The method of claim 35, wherein either (a) said executable instructions are designed to enable the selected one of the client system and the information server to provide said information browsing assistance by modifying an environment attribute of a browsing environment of said client system, or (b) the method further comprises a second server system providing said information browsing assistance to the selected one of said client system and the information server by modifying an environment attribute of the browsing environment of said client system.

47. The method of claim 46, wherein said environment attribute is an environment attribute selected from a group of environment attributes comprising a display resolution attribute, a color resolution attribute, a font selection attribute, a media player preference attribute, an add-on selection attribute, and a plug-in selection attribute.

48. The method of claim 35, wherein said executable instructions are designed to implement a browser helper including at least a monitor function, designed to receive a notification of a receipt of a selected one of information forming a request for said first information page, and the request for said first information page, and in response, notifying a analyzer function of receipt of said notification.

49. The method of claim 48, wherein either (a) said browser helper further includes said analyzer function to perform said conditional provision of information browsing assistance, in response to receipt of said notification, or (b) the method further a second server having said analyzer function to perform

said conditional provision of information browsing assistance for said client system, in response to receipt of said notification from said client system.

50. A server system comprising:

storage medium having stored therein at least a selected one of

- (a) first executable instructions designed to enable a selected one of a first client system and an information server to conditionally provide information browsing assistance to the first client system based at least in part on first information of a first locator of a first information page requested to be retrieved and displayed on the first client system, and second executable instructions designed to provide the selected one of the first client system and the information server with said first executable instructions in response to a request for said first executable instructions, and
- (b) third executable instructions designed to enable the server system to conditionally provide information browsing assistance to a second client system based at least in part on second information of a second locator of a second information page requested to be retrieved and displayed on said second client system,

said first and second information forming at least in part said first and second locators respectively, and said first and second locators identifying said first and second information pages, and a first and a second location from which said first and second information pages are to be retrieved respectively; and

at least one processor coupled to the storage medium to execute at least one of said second and third executable instructions.

51. The server system of claim 50, wherein said locator is a uniform resource locator (URL).

52. The server system of claim 50, wherein
said first executable instructions are designed to enable the selected one of the first client system and the information server to determine a selected one of whether a first locator forming information condition and whether a first locator based condition for providing information browsing assistance is met, and

said third executable instructions are design to enable the server system to determine for said second client system a selected one of whether a second locator forming information condition and whether a second locator based condition for providing information browsing assistance is met.

53. The server system of claim 50, wherein
each of said first and second locators is a uniform resource locator (URL);

said first executable instructions are designed to enable the selected one of the first client system and the information server to determine a selected one of whether said first information forming said first URL satisfies a first URL forming information condition and whether said first URL satisfies a first URL based condition for providing information browsing assistance is met; and

said third executable instructions are design to enable the server system to determine for said second client system a selected one of whether a second URL forming information condition and whether a second locator based condition for providing information browsing assistance is met.

54. The server system of claim 53, wherein
each condition comprises a pattern specifying a selected one of a family of URL forming information and a family of URLs;

said first executable instructions are designed to match the selected one of said first URL forming information and said first URL against a first plurality of patterns; and

said third executable instructions are design to match the selected one of said second URL forming information and said second URL against a second plurality of patterns for said second client system.

55. The server system of claim 54, wherein

each pattern comprises a plurality of portions correspondingly stored in a plurality of nodes of a tree data structure, with the plurality of nodes having a child leaf node specifying information browsing assistance to be provided; and

said first executable instructions are designed to enable the selected one of the first client system and the information server to perform said matching by traversing a first tree data structure;
said third executable instructions are designed to enable the server system to perform said matching by traversing a second tree data structure for said second client system.

56. The server system of claim 50, wherein

said first executable instructions are designed to enable the selected one of the first client system and the information server to provide said information browsing assistance by displaying a second information page; and

said third executable instructions are designed to enable the server system to provide said information browsing assistance to said client system by causing a second information page to be displayed on said client system.

57. The server system of claim 56, wherein said second information page is displayed in a manner that effectively replaces said first information page.

58. The server system of claim 56, wherein said second information page is additionally displayed in a manner that is complementary to said first information page.

59. The server system of claim 56, wherein said second information page comprises a plurality of locators identifying a plurality of information pages and corresponding locations from which the identified information pages of said second information page are to be retrieved.

60. The server system of claim 50, wherein

said first executable instructions are designed to enable the selected one of the first client system and the information server to provide said information browsing assistance by modifying a first environment attribute of the a first browsing environment of said first client system; and

said third executable instructions are designed to enable the server system to provide said information browsing assistance to said client system by modifying a second environment attribute of a second browsing environment of said second client system.

61. The server system of claim 60, wherein each of said first and second environment attributes is an environment attribute selected from a group of environment attributes comprising a display resolution attribute, a color resolution attribute, a font selection attribute, a media player preference attribute, an add-on selection attribute, and a plug-in selection attribute.

62. The server system of claim 50 wherein said first executable instructions are designed to implement a browser helper including at least a monitor function, designed to receive a notification of a receipt of a selected one of information forming a request for said first information page and the request for said first information page, and in response, notifying a analyzer function of receipt of said notification.

63. The server system of claim 62, wherein said browser helper further includes said analyzer function to perform said conditional provision of information browsing assistance, in response to receipt of said notification.

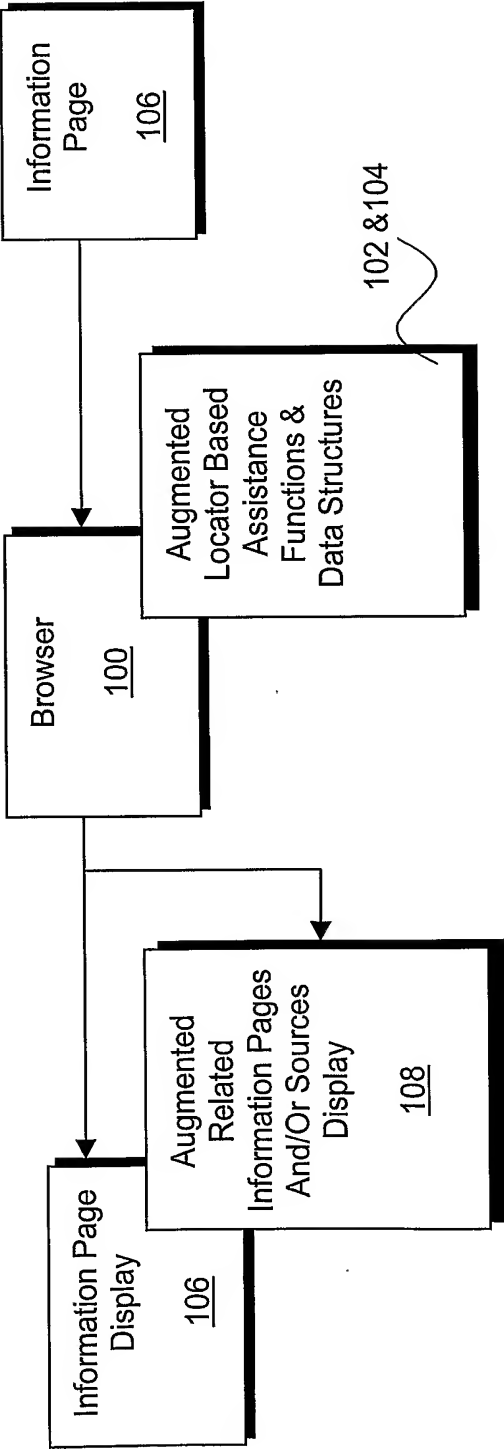


FIG. 1

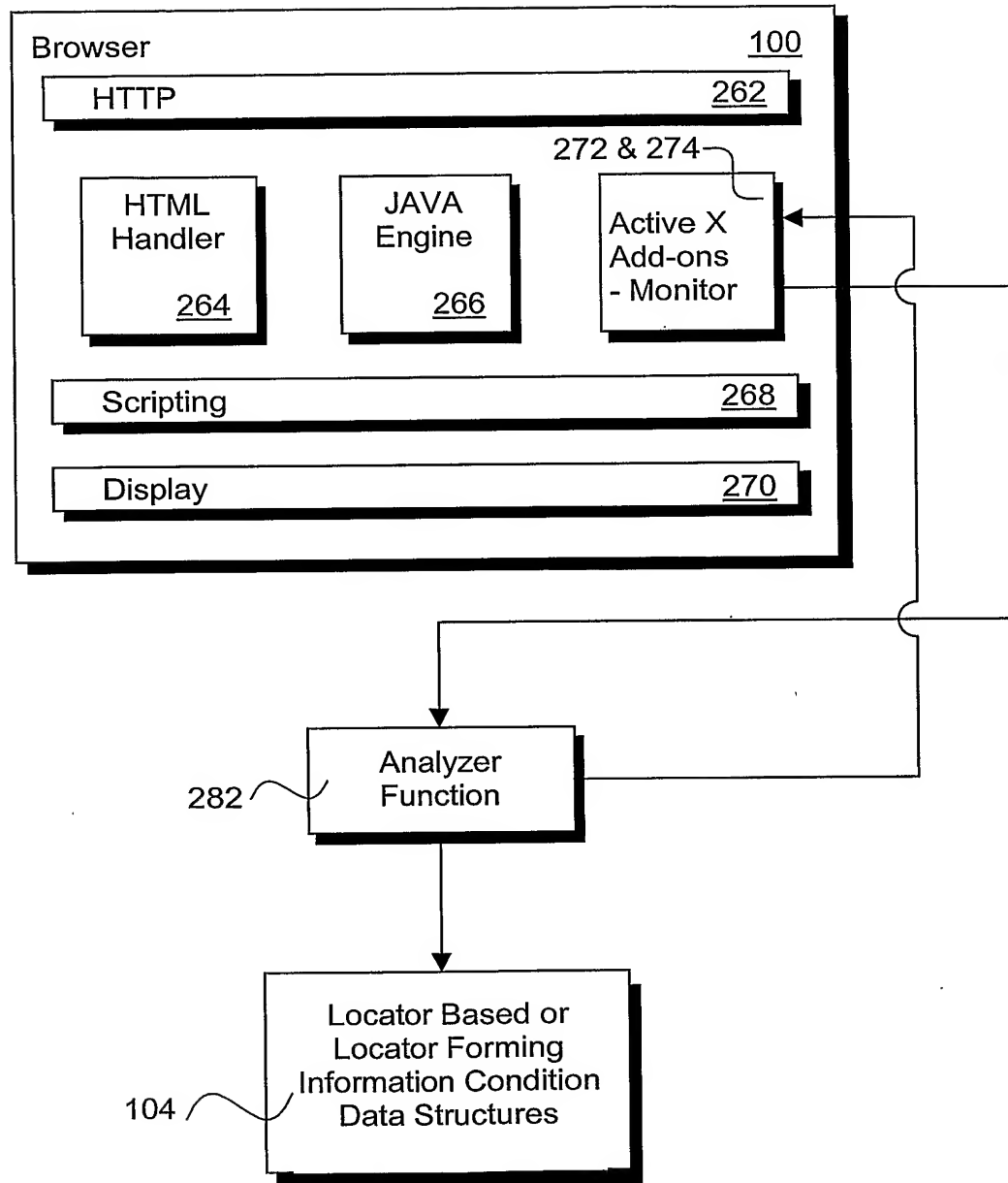


FIG. 2

URLs ~ 300

http://www.msnbc.com/news/NEWS_Front.asp?0dm=C---N&ta=y ~ 302

<http://dailynews.yahoo.com/> ~ 304

http://www.msnbc.com/news/SPT_Front.asp?0dm=---&ta=y ~ 306

<http://sports.yahoo.com/> ~ 308

<http://www.google.com/search?q=dog> ~ 310

<http://www.altavista.com/sites/search/web?q=dog&pg=q&kl=XX> ~ 312

Fig. 3a

URL Patterns ~ 320

http://*/*/NEWS* ~ 322

http://*news*/ ~ 323

http://*/*/SPT* ~ 324

http://sports*/ ~ 325

http://*/*/q=dog* ~ 326

http://*/*/*/q=dog* ~ 327

Fig. 3b

<URLTrigger target="http://www.mysite.com/news">
 <URLPattern> http://*/*/NEWS* </URLPattern> ~ 342
 <URLPattern> http://*news*/ </URLPattern> ~ 344
</URLTrigger>

 340

<URLTrigger target="http://www.mysite.com/sports">
 <URLPattern> http://*/*/SPT* </URLPattern> ~ 362
 <URLPattern> http://sports*/ </URLPattern> ~ 364
</URLTrigger>

 360

<URLTrigger target="http://www.mysite.com/dog">
 <URLPattern> http://*/*q=dog* </URLPattern> ~ 382
 <URLPattern> http://*/*/*/*q=dog* </URLPattern> ~ 384
</URLTrigger>

 380

Fig 3c

URL Forming Information Patterns ~ 330

***NEWS* ~ 332**

***news* ~ 333**

***SPT* ~ 334**

***sports* ~ 335**

***dog* ~ 336**

***q=dog* ~ 337**

Fig. 3d

```
<UFITrigger target="http://www.mysite.com/news">  
  <UFIPattern>*NEWS*</UFIPattern> ~ 352  
  <UFIPattern>*news*</UFIPattern> ~ 354  
</UFITrigger>
```

350

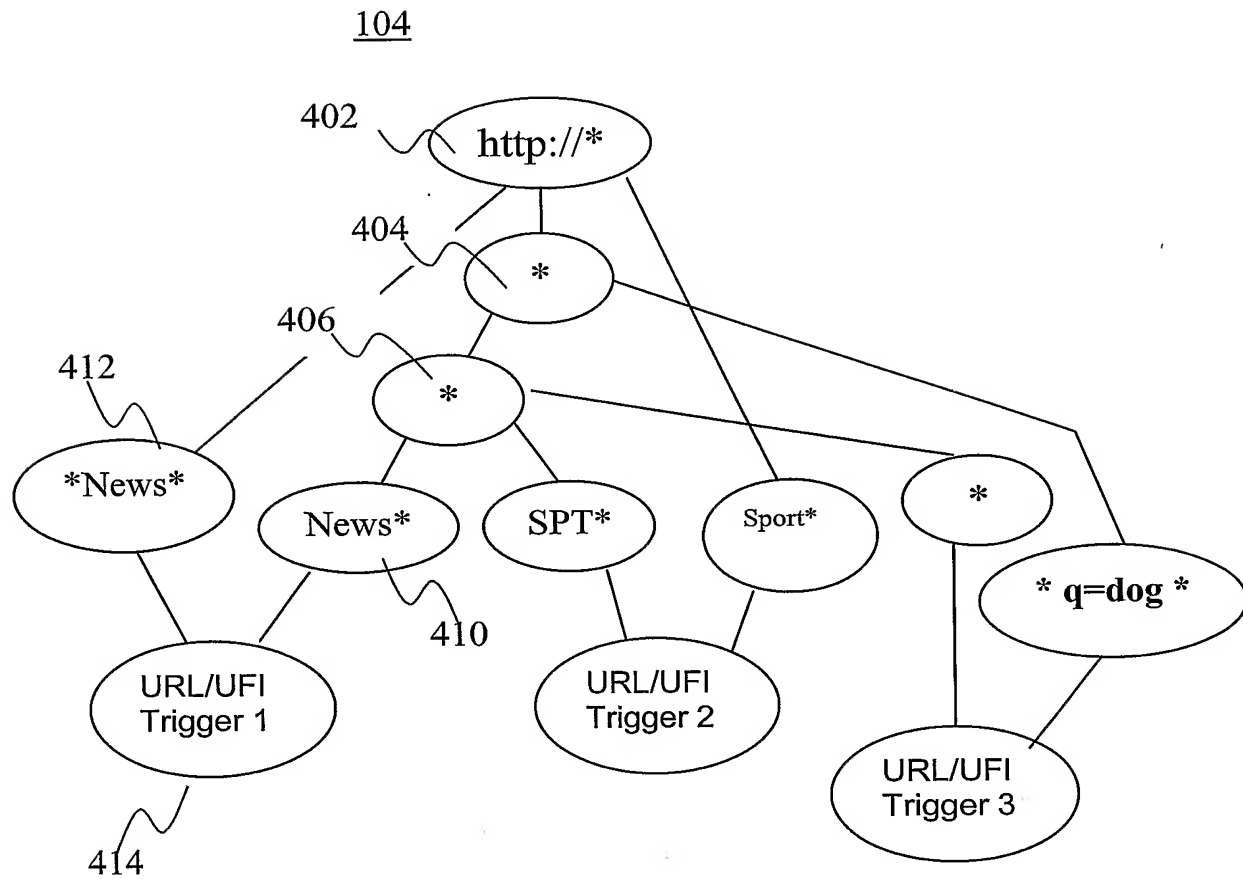
```
<UFITrigger target="http://www.mysite.com/sports">  
  <UFIPattern> *SPT* </UFIPattern> ~ 372  
  <UFIPattern> *sports* </UFIPattern> ~ 374  
</UFITrigger>
```

370

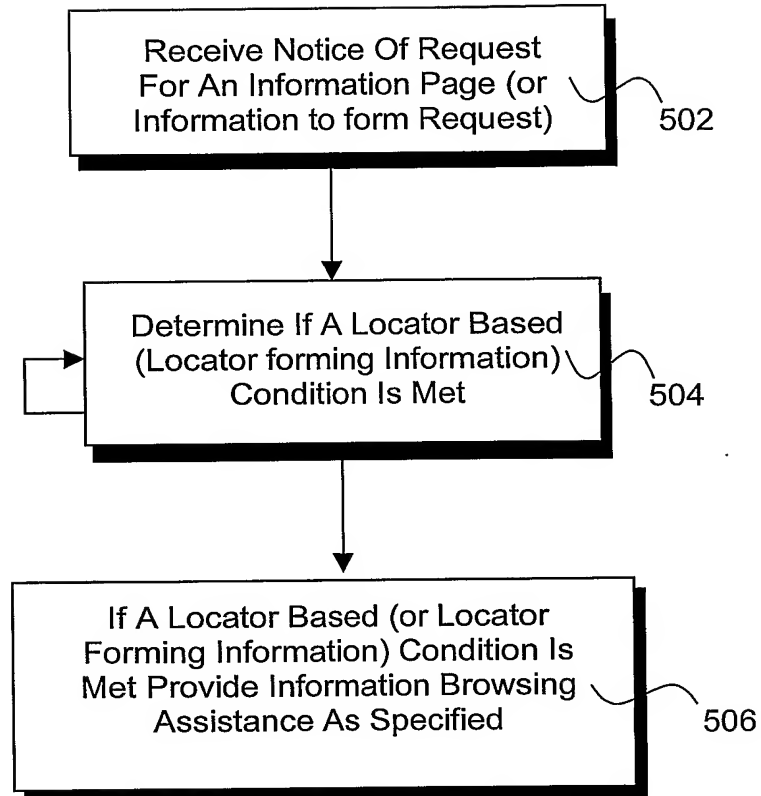
```
<UFITrigger target="http://www.mysite.com/dogs">  
  <UFIPattern> _dog* </UFIPattern> ~ 392  
  <UFIPattern> *q=dog* </UFIPattern> ~ 394  
</UFITrigger>
```

390

Fig 3e

**Figure 4**

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**FIG. 5**

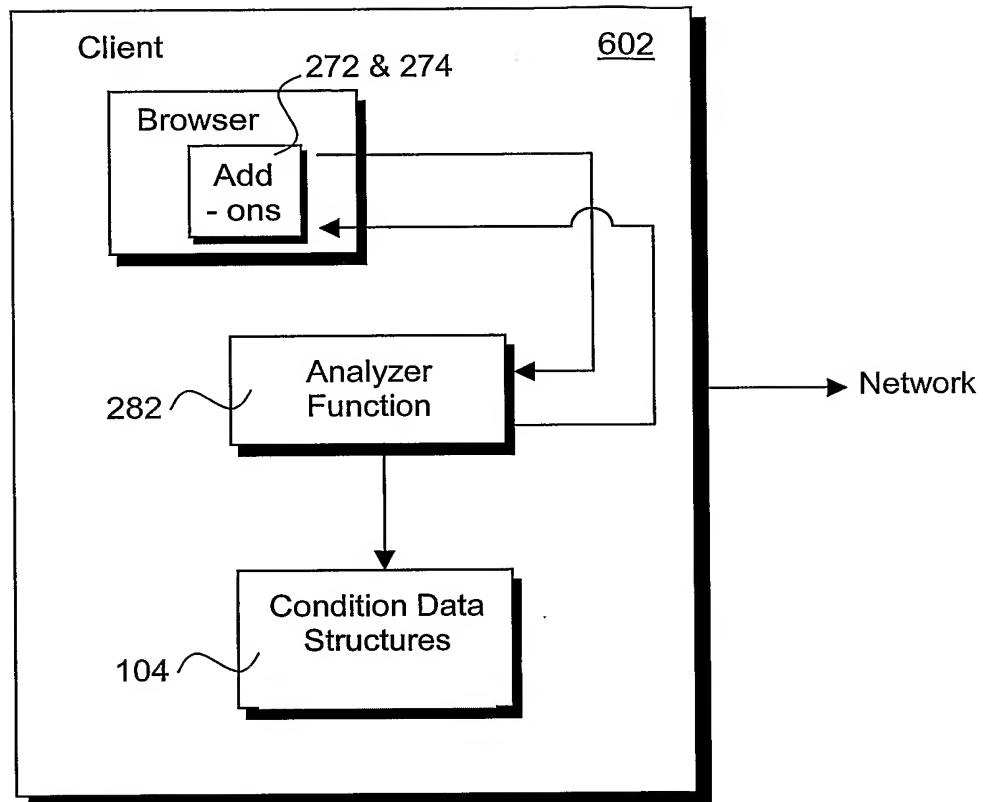


FIG. 6a

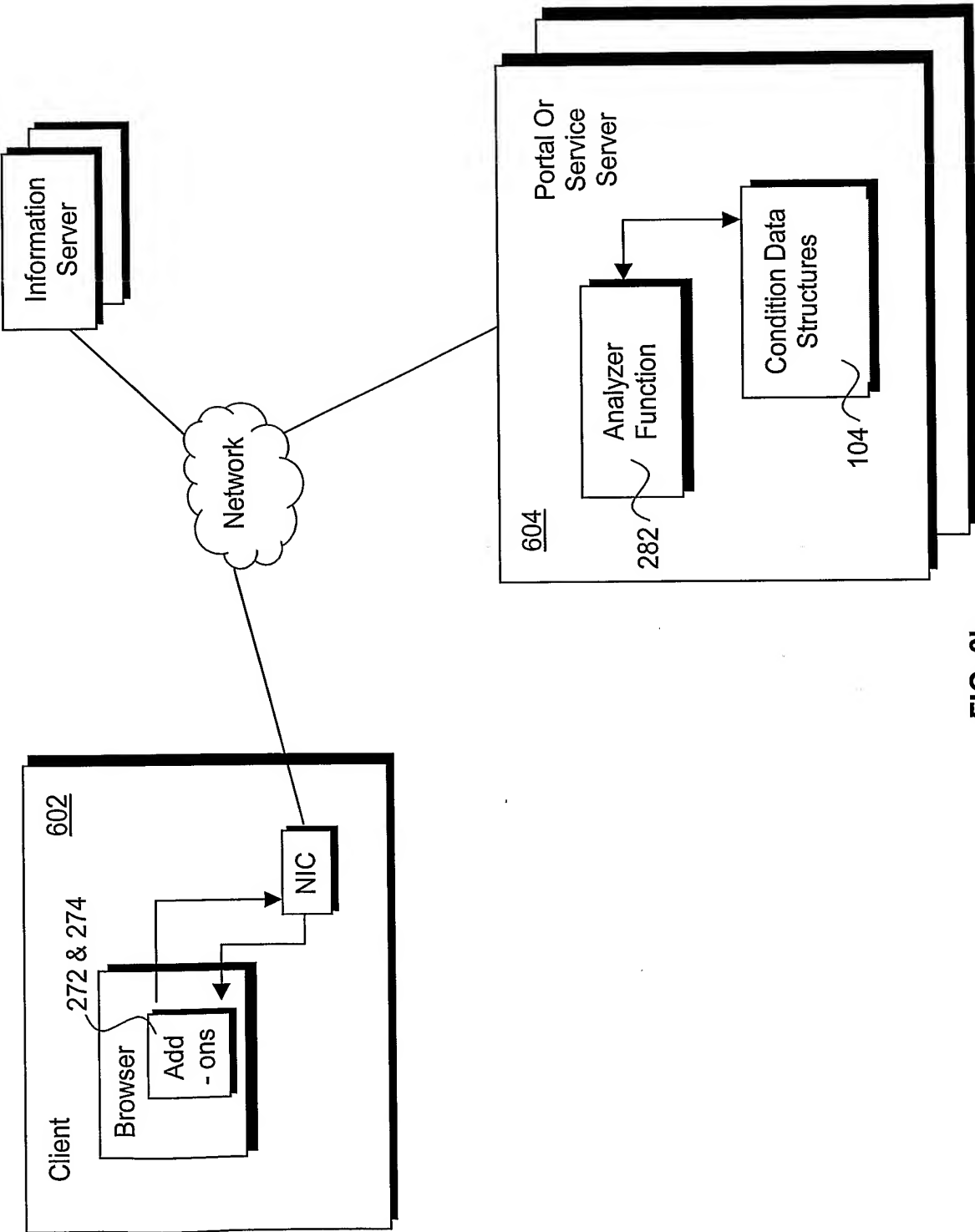


FIG. 6b

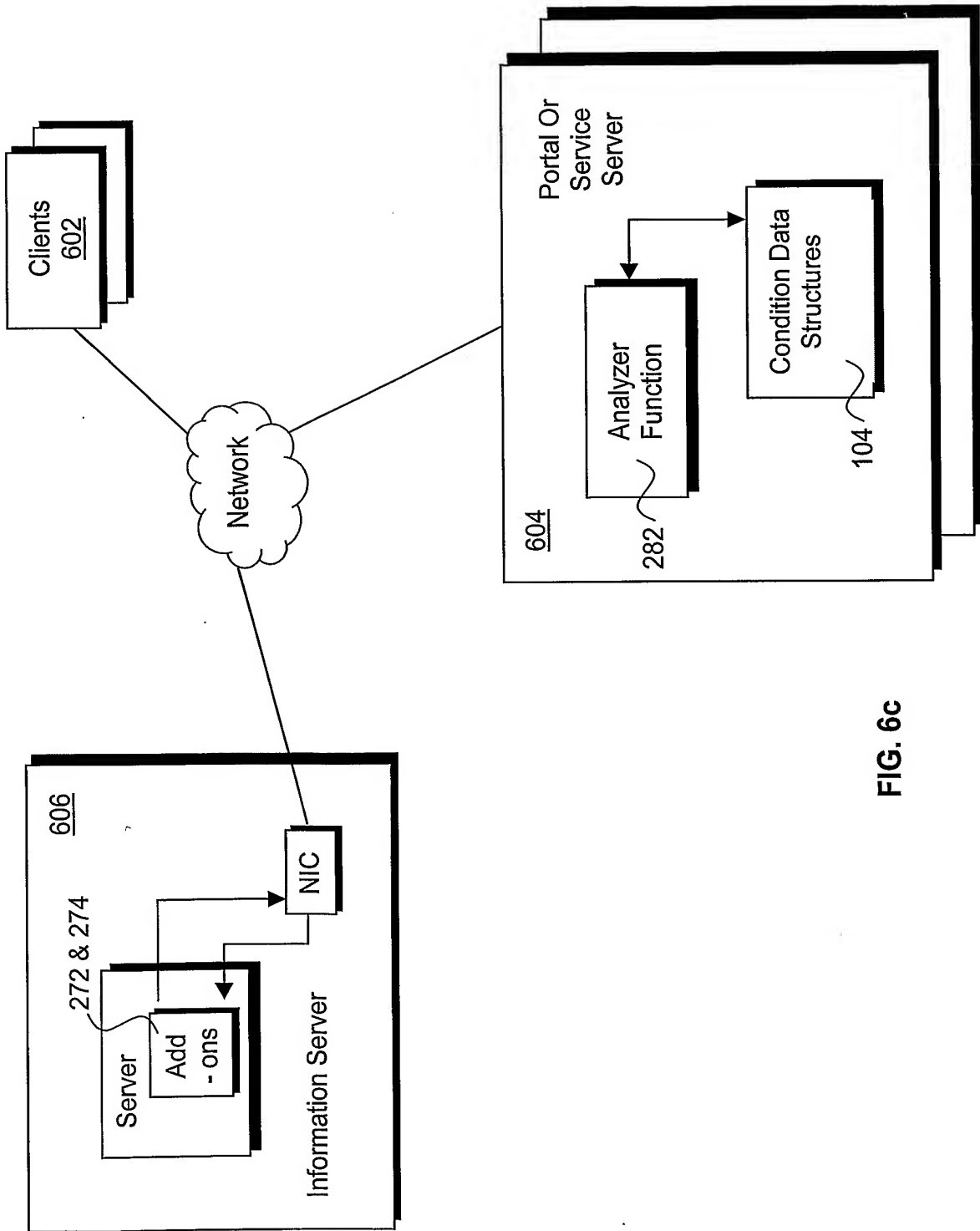


FIG. 6c

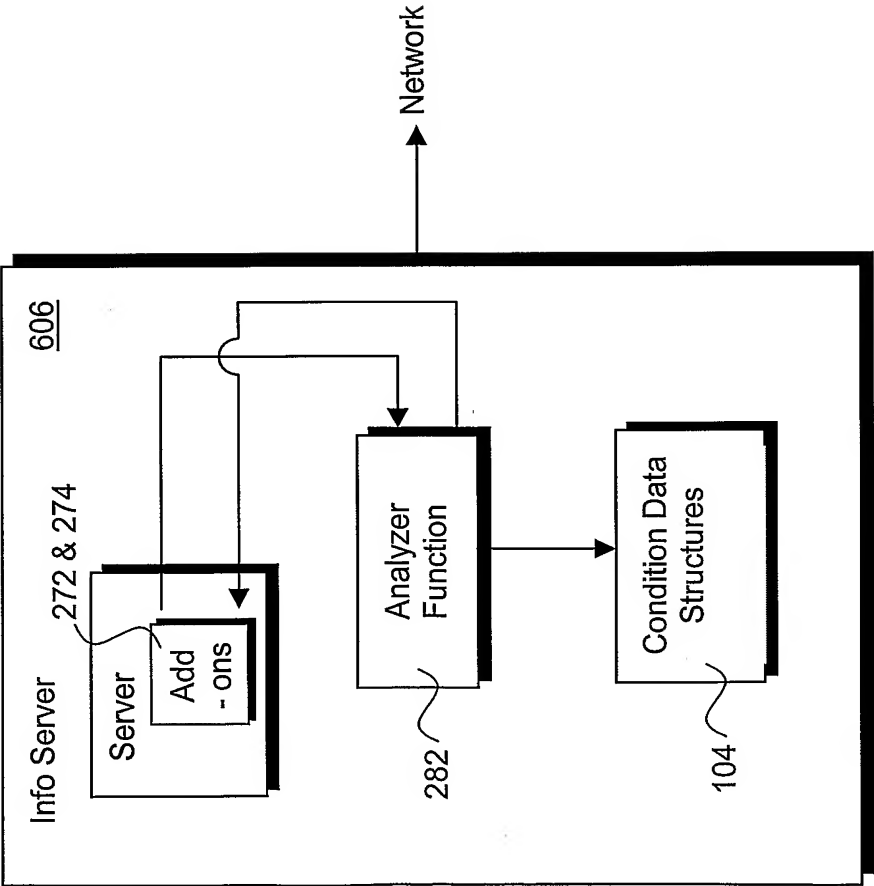


FIG. 6d.

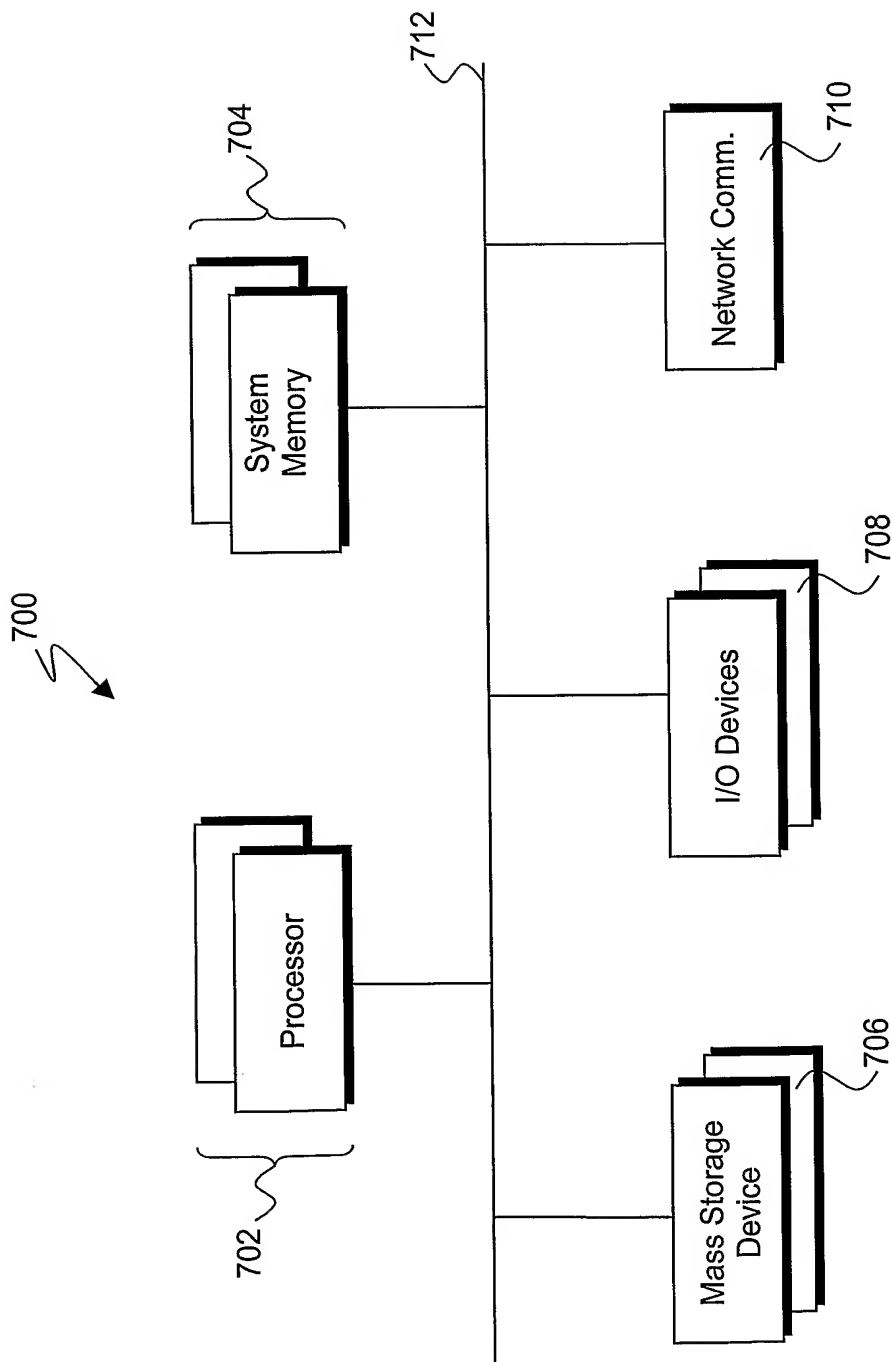


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/41456

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 3/14, 13/00, 15/16, 17/60

US CL : 709/200, 219, 245; 345/762; 705/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/200, 219, 245; 345/762; 705/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 6,332,158 B1 (RISLEY et al) 18 December 2001, see whole document.	1-63
Y, P	US 6,338,094 B1 (SCOTT et al) 08 January 2002, see whole document.	1-63
Y, P	US 6,484,149 B1 (JAMMES et al) 19 November 2002, see whole document.	1-63
Y, E	US 6,496,203 B1 (BEAUMONT et al) 17 December 2002, see whole document.	1-63



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

21 March 2003 (21.03.2003)

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10 APR 2003

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

PCT/US02/41456

Continuation of B. FIELDS SEARCHED Item 3:

East, West search:

client, server, web page, URL, information locator, retrieving web page, display web page, browsing assistance.